Missouri Pediatric Nutrition Surveillance System

2000 Full Report

Missouri Department of Health and Senior Services
Division of Community Health

Preface

This Missouri Pediatric Nutrition Surveillance report summarizes selected indices of health and nutritional status received from WIC clinics in 114 counties and St. Louis City in Missouri, which contributed to the program.

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The 2000 Missouri Pediatric Nutrition Surveillance System Executive Summary

With the assistance of the Centers for Disease Control and Prevention (CDC), the Missouri Pediatric Nutrition Surveillance System (PedNSS) monitors the growth, anemia and breastfeeding status of children in the state of Missouri who have participated in the federally-funded maternal and child health and nutrition programs such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Currently data collected in this system is primarily from low- to moderate-income infants and children participating in these programs.

This report provides:

1. Health and nutritional status indicators for measuring the health conditions of children aged 0-4 years who participated in the WIC program of Missouri in 2000;
2. Sociodemographic characteristics of the children in the WIC program;
3. Prevalence rates of health and nutrition indicators of 2000; and
4. Trends of prevalence rates of health and nutrition indicators from 1992 (or 1993) to 2000.

Health and Nutrition Indicators

Health and nutritional status data collected from children aged 0 to 4 years include birth weight (low birth weight), height and weight (short stature, underweight and overweight), anemia (low hemoglobin/hematocrit or low Hb/Hct), and breastfeeding (ever breastfed, breastfed at least 6 months, and breastfed at least 12 months). The data on birth weight and breastfeeding status are collected on children from birth to age 2.

Sociodemographic Characteristics

Missouri Department of Health and Senior Services contributed 136,979 individual children's records in 2000 to CDC for analysis. The demographic information from the Missouri PedNSS describes the percentage distributions of age, race/ethnicity and regions.

The age distributions of the children in the 2000 Missouri PedNSS showed that children from 0-11 months old composed a large percentage (38.9 percent) of the PedNSS population. The children aged 12-23 months old, 24-35 months old, and 3-4 years old were 21.2 percent, 15.3 percent, and 24.5 percent respectively.

Consistent with previous years' data, the white and black children were the two major race/ethnic groups in Missouri's PedNSS population. The percentage of white children was 67.5 percent, and that of black children was 22.6 percent. The total number of children of these two race/ethnic groups comprised 90.1 percent, and that of the other three race/ethnic groups

(Hispanic, American Indian/Alaskan Native, and Asian/Pacific Islander) composed less than 2 percent of the 2000 Missouri PedNSS population.

Short Stature

The prevalence of short stature in the 2000 Missouri PedNSS was 6.3 percent. Among the five race/ethnic groups, the highest rate of short stature in Missouri PedNSS in 2000 was found in black children (6.5 percent). Among the seven districts of Missouri, the Northwestern/Metro District had the highest rate (6.7 percent) of short stature in 2000. The overall prevalence rate of short stature in Missouri PedNSS declined steadily from 9.3 percent in 1992 to 6.1 percent in 1999, and then it increased again from 6.1 percent in 1999 to 6.3 percent in 2000.

Underweight

In 2000, the percentage of children found to be underweight was 5.0 percent in Missouri PedNSS. In 2000, black children in Missouri PedNSS had the highest percentage (8.4 percent) of underweight among the five ethnic groups. Regionally, Missouri's Eastern District had the highest percentage (9.3 percent) of underweight in PedNSS in 2000. The trend of underweight of Missouri PedNSS had been going down all the years from 8.3 percent in 1992 to 5.0 percent in 2000.

Overweight

In 2000, Hispanic children in Missouri PedNSS had the highest percentage of overweight among the five race/ethnic groups. White, black, and Asian/Pacific children in Missouri PedNSS had approximately the same percentages (10.7 percent, 10.1 percent, and 9.0 percent respectively) in this year. Regionally, the Southeastern District had the highest percentage (12.0 percent) of overweight children in 2000. The trend of overweight for children in Missouri PedNSS went down from 8.8 percent in 1991 to 8.3 percent in 1993, and then went up through the years to 10.8 percent in 2000.

Low Birth Weight

In the 2000 Missouri PedNSS, black children had the highest rate of low birth weight (12.8 percent). Black children were the only race/ethnic group that had a higher rate of low birth weight than the national average level (9.2 percent) in this year. Missouri's Eastern District had a relatively higher rate of low birth weight (10.8 percent) in 2000. The trend of low birth weight rate of Missouri PedNSS showed slight fluctuations from 1992 to 2000.

Anemia

In 2000, the prevalence of anemia (low Hb/Hct) in the Missouri PedNSS was 16.6 percent. The black children's rate of anemia (26.1 percent) in Missouri was high compared with the average level of the state. Regionally, four of the seven districts of Missouri (Northwestern/Metro, Eastern, Central, and Southeastern) had higher rates of anemia than the national average level. Especially, the Northwestern/Metro District and the Eastern District had higher rates of anemia (19.9 percent and 19.8 percent respectively) among children in the 2000 Missouri PedNSS compared with other regions of Missouri. There had been a general declining trend for the rate of anemia among children in PedNSS in Missouri. However, the rate of anemia of Missouri's PedNSS had always been higher than the average level of the nation.

Infant Feeding Practice

In the Missouri 2000 PedNSS, breastfeeding initiation rate was 45.7 percent. Black children had the lowest rate (33.9 percent) of ever being breastfed. Regionally, Missouri's Southeastern District had the lowest rate of ever breastfeeding (37.7 percent) in this year. The year 2000 objective which was to increase to at least 75 percent the proportion of mothers who breastfed their babies in the early postpartum period was not achieved in the Missouri PedNSS population. (Healthy People 2000 and healthy Missourians 2000)

In 2000, the percentage of infants who were breastfed for at least 6 months in Missouri PedNSS was 25.4 percent. The lowest rate of being breastfed for at least 6 months (22.8 percent) in Missouri was found among Black children. Southeastern District had the lowest percentage (17.8 percent) in this year. The increasing trend of breastfeeding duration in Missouri's PedNSS population was not as stable as that of the nation. There was a sharp decline from 23.6 percent in 1995 to 18.0 percent in 1996, and then the rate went up each year to 25.4 percent in 2000.

In Missouri 2000 PedNSS, the average level of breastfeeding duration for at least 12 months was 21.3 percent. Among the five race/ethnic groups, the lowest rate (18.6 percent) was found among black children. All the seven districts in Missouri had higher percentages of breastfeeding duration for at least 12 months than the national average level (12.8 percent) in 2000. The lowest rate (14.1 percent) was found in the Southeastern District. There had been a general trend of increase of the rate in Missouri PedNSS since 1993.

Conclusions and Recommendations

The groups at risk in Missouri PedNSS with regard to the eight health and nutritional status indicators have been searched by demographic variables of race/ethnic groups and geographic regions.

Looking from the perspective of race/ethnic groups, the black children in Missouri PedNSS were at the highest risk in regard to the selected nutritional and health indicators. The black children had the highest rates of short stature, underweight, low birth weight, and anemia. They had the lowest rates of breastfeeding initiation, breastfeeding duration for at least 6 months, and breastfeeding duration for at least 12 months in 2000. In order for future intervention programs to be more effective, a greater focus needs to be placed on black children and their mothers, and more efforts should be given to the clarification of the underlying causes for this phenomenon.

Looking from the perspective of the seven regions of Missouri, the Eastern District of Missouri PedNSS had the highest risk of health problems in regard to the eight indicators. It is recommended that greater efforts be placed on improving the nutritional and health status of children and their mothers in the Eastern District of Missouri.

INTRODUCTION

Background of Missouri PedNSS

The state of Missouri has participated in the Pediatric Nutrition Surveillance System (PedNSS) since 1988. The PedNSS was established in 1973 by the Department of Health and Human Services, Division of Maternal and Child Health and Centers for Disease Control and Prevention (CDC). With the assistance of CDC the PedNSS monitors the growth, anemia, and breastfeeding status of children in the United States who participate in federally-funded maternal and child health and nutrition programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Currently data collected in this system is primarily from low- to moderate-income infants and children participating in these programs.

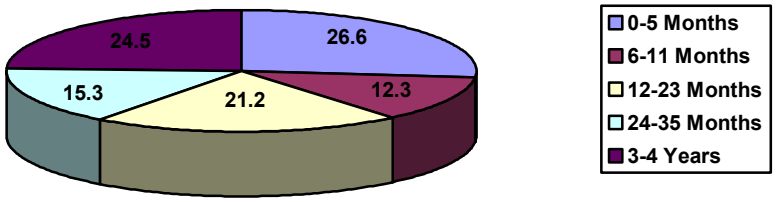
Poor nutritional status can affect growth, development and resistance to disease. Children, particularly those of low-income families, are highly vulnerable to nutrition-related health problems. The PedNSS is intended to monitor trends and patterns of key indicators of child nutritional status for program planning, developing appropriate health and nutrition interventions, and evaluation of programs.

Nutritional status data collected for children aged 0 to 4 years include weight, height, hemoglobin concentration level measured at specified visits for the WIC program (e.g. certification and re-certification). The anthropometric and hematologic data are used to calculate the nutrition indices that define short stature (low height-for-age), underweight (low weight-for-height), overweight (high weight-for-height), and anemia (low hemoglobin concentration or low hematocrit level). The data on birth weight and breastfeeding status are collected on children from birth to age 2.

Demographic Information about Missouri PedNSS

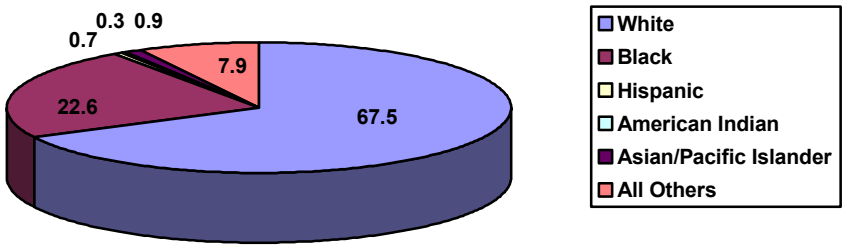
Missouri Department of Health and Senior Services contributed 136,979 individual children's records in 2000 to CDC for analysis. In this year, 100 percent of the PedNSS data were obtained on infants and children enrolled in the WIC program in Missouri. The demographic information about Missouri PedNSS is the percentage distributions of age, race/ethnicity and regions.

Figure 1. Percentage Distribution for Age from the 2000 Missouri PedNSS



Out of the 136,979 children in the records, 36,405 (26.6 percent) were 0-5 months old, 16,895 (12.3 percent) were 6-11 months old, 29,104 (21.2 percent) were 12-23 months old, 21,023 (15.3 percent) were 24-35 months old, and 33,552 (24.5 percent) were 3-4 years old.

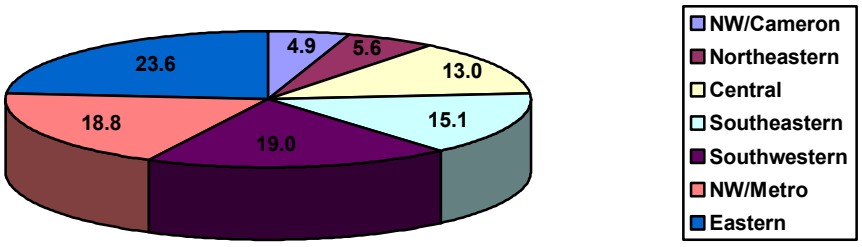
Figure 2. Percentage Distribution for Race/Ethnicity from the 2000 Missouri PedNSS*



*The percentage of population for Hispanic children was 0.7 percent, that for American Indian/Alaskan Native was 0.3 percent, and that for Asian Pacific Islander was 0.9 percent. The group designated "All Others" is a valid response provided by the child's guardian when asked to indicate race/ethnic group. This category can include a race/ethnic group not represented by the previous four designations, or can include any combination of the race/ethnic group designations.

As reported in the previous years, the white and black children were the two major race/ethnic groups in Missouri's PedNSS population in 2000. Out of the 136,979 children in the records, 92,454 (67.5 percent) were white children, 31,023 (22.6 percent) were black children. The children of these two race/ethnic groups were 90.1 percent in 2000. The total number of participants of the other three race/ethnic groups (Hispanic, American Indian/Alaskan Native, and Asian/Pacific Islander) was 2,633 which composed less than 2 percent of the PedNSS population in this year.

Figure 3. Percentage Distribution for Regions from the 2000 Missouri PedNSS



The Northwestern District includes two PedNSS regions, Northwestern/Cameron and Northwestern/Metro. Northwestern/Cameron includes counties of Atchison, Nodaway, Worth, Harrison, Holt, Andrew, Gentry, Dekalb, Davies, Buchanan, Clinton, Caldwell, Carroll, and Johnson. Northwestern Metro includes counties of Platte, Clay, Ray, Lafayette, Jackson, and Cass.

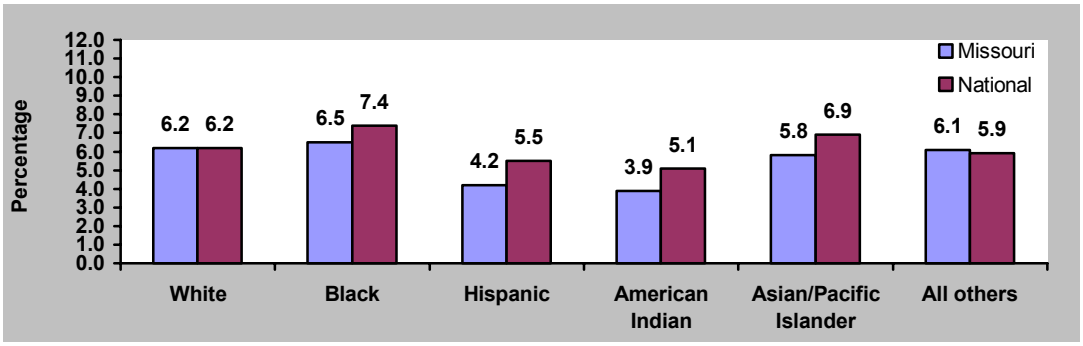
Among the seven regions, the Eastern District had only four counties. However, this small geographic area was the only region that had more than 20 percent of the Missouri PedNSS population in 2000. Other regions that had relatively large PedNSS population were the Southwestern District and the Northwestern/Metro District. The Southwestern District had 25,963 participants (19.0 percent), and the Northwestern/Metro District had 25,749 participants (18.8 percent).

HEALTH AND NUTRITIONAL STATUS INDICATORS AND PREVALENCE

Short Stature

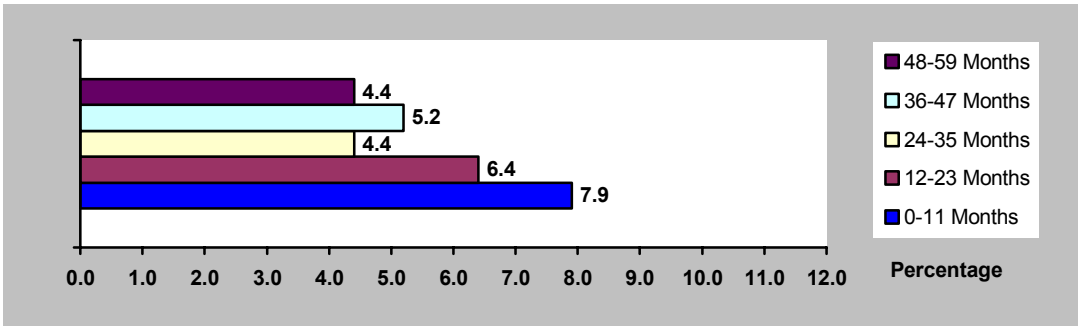
Short stature in children is defined by CDC as less than the 5th percentile of the length-for-age. Short stature reflects the long-term health and nutrition history of the child and, in some children, is related to factors such as low birth weight and short parental statures. Short stature may also be indicative of inadequate diet, delayed development and/or compromised health.

Figure 4. Prevalence of Short Stature by Race/Ethnicity, 2000 Missouri and National PedNSS



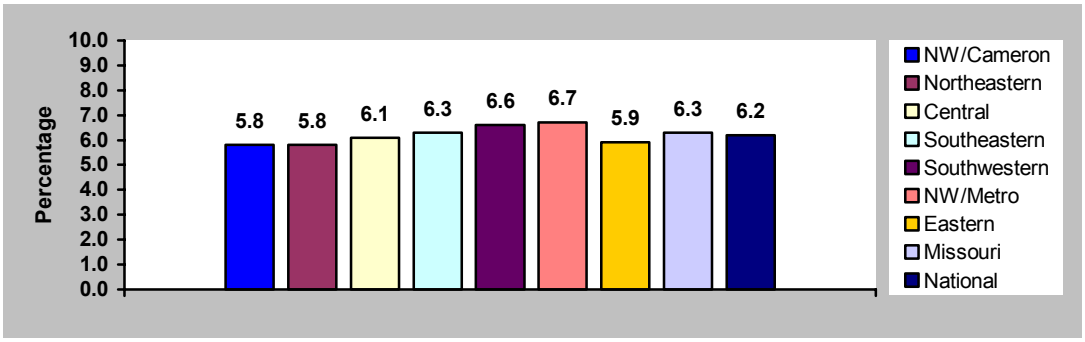
The prevalence of short stature in 2000 Missouri PedNSS was 6.3 percent, while the national rate in 2000 was 6.2 percent. Among the five race/ethnic groups, the highest rate of short stature in Missouri PedNSS in 2000 was seen among black children (6.5 percent). The lowest rate of short stature in 2000 was among American Indian/Alaskan Native children (3.9 percent).

Figure 5. Prevalence of Short Stature by Age, 2000 Missouri PedNSS



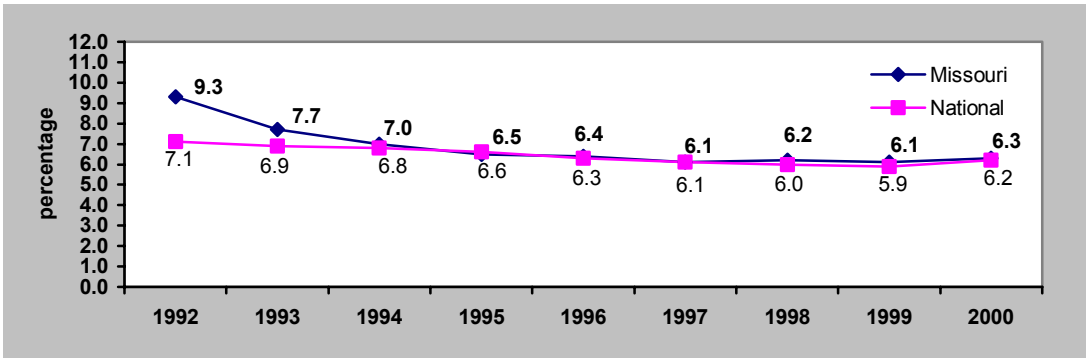
Among the five age groups, the children aged 0-11 months had the highest rate (7.9 percent) of short stature in 2000, and the children aged 24-35 months and children aged 48-59 months had the lowest rate (4.4 percent).

Figure 6. Prevalence of Short Stature by Regions, State, and Nation, 2000 Missouri and National PedNSS



Among the seven regions of Missouri, the Northwestern/Cameron District and the Northeastern District had the lowest rates (5.8 percent) of short stature in 2000. The Northwestern/Metro District had the highest rate (6.7 percent) of short stature in 2000.

Figure 7. Nine-Year Trend in Prevalence of Short Stature, Missouri and National PedNSS



The overall prevalence rate for short stature in Missouri PedNSS declined steadily from 9.3 percent in 1992 to 6.1 percent in 1999, and then it increased again from 6.1 percent in 1999 to 6.3 percent in 2000. This trend corresponded with the national trend.

Underweight (Low Weight-for-Length)

Underweight in children is defined by CDC as falling less than the 5th percentile for the weight-for-length or BMI-for-age.

In 2000, the percentage of children found to be underweight was 5.0 percent in Missouri PedNSS and 5.4 percent in the national PedNSS. In 2000, black children in Missouri PedNSS had the highest percentage (8.4 percent) of underweight among the five race/ethnic groups. In this year, Hispanic children in Missouri PedNSS had the lowest percentage (1.7 percent) of underweight.

Figure 8. Prevalence of Underweight by Race/Ethnicity, Missouri and National PedNSS 2000

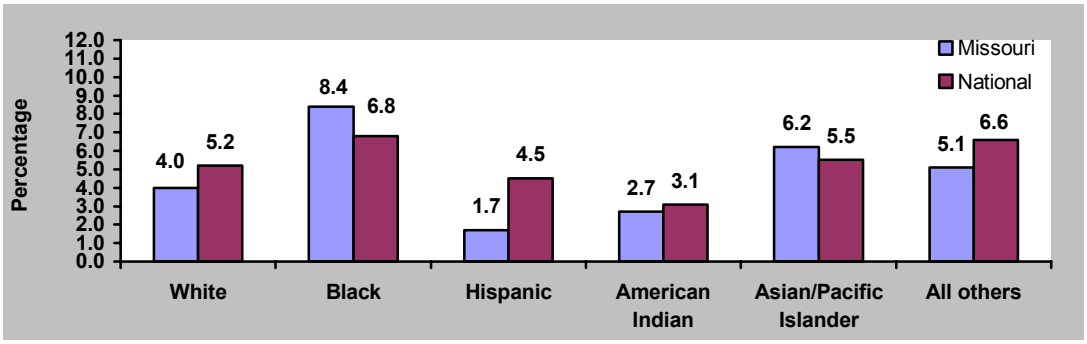
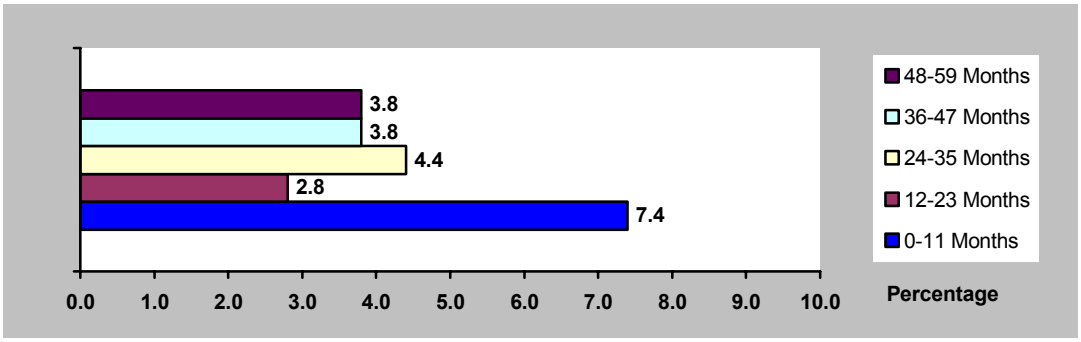
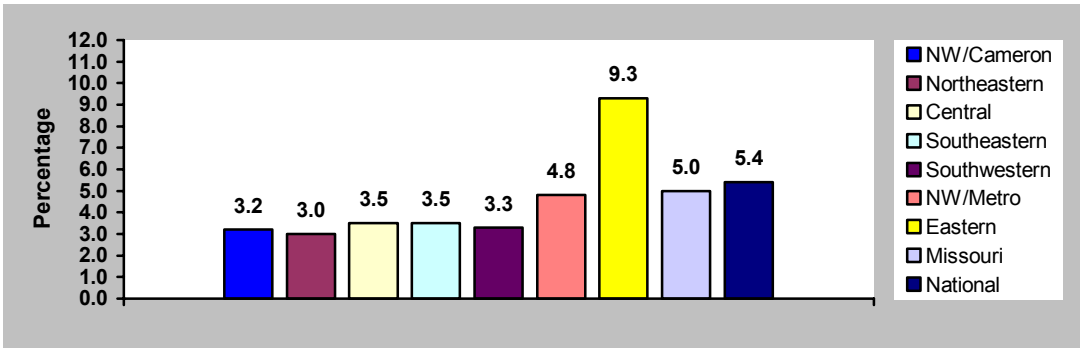


Figure 9. Prevalence of Underweight by Age, 2000 Missouri PedNSS



Among the five age groups, the children aged 0-11 months had the highest rate (7.4 percent) of underweight in 2000, and the children aged 12-23 months had the lowest rate (2.8 percent).

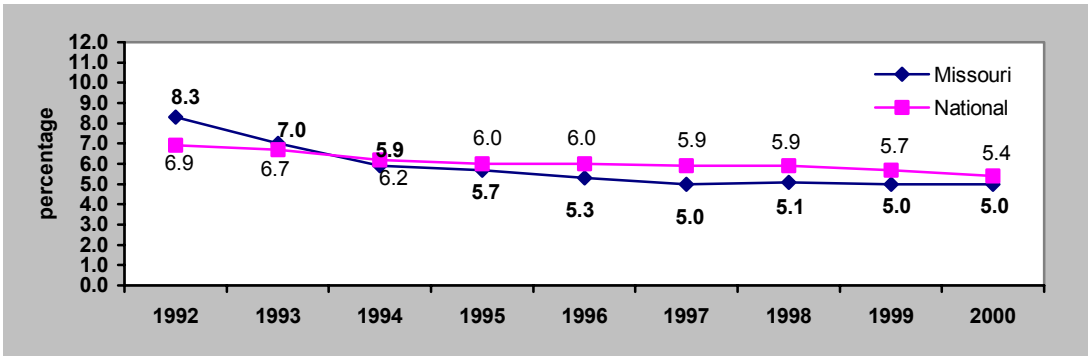
Figure 10. Prevalence of Underweight by Regions, State, and Nation, Missouri and National PedNSS 2000



Regionally, Missouri's Eastern District had the highest percentage (9.3 percent) of underweight in PedNSS in 2000. Surprisingly this percentage was almost three times as high as most of the other regions.

The trend of underweight of Missouri PedNSS had been going down all the years from 1992 to 2000, and the difference between the percentage of 1992 (8.3 percent) and the percentage of 2000 (5.0 percent) was 3.3 percent. This difference was larger than the difference (1.5 percent) between these two years for the national PedNSS.

Figure 11. Nine-Year Trends in Prevalence of Underweight, Missouri and National PedNSS 2000



Overweight (High Weight-for-Length)

Overweight in children is defined by CDC as above the 95th percentile of the weight-for-length or BMI-for-age. The prevalence of obesity among children in low-income populations has been one of the most serious nutrition-related problems and growing public health concern in Missouri and the United States.

In 2000, Hispanic children in Missouri PedNSS had the highest percentage of overweight compared to the other four race/ethnic groups. This rate was consistent with the national rate which was 16.1 percent, the second highest rate among all the race/ethnic groups in the national PedNSS. The white, black, and Asian/Pacific children in Missouri PedNSS had approximately the same percentages in this year.

Figure 12. Prevalence of Overweight by Race/Ethnicity, 2000 Missouri and National PedNSS

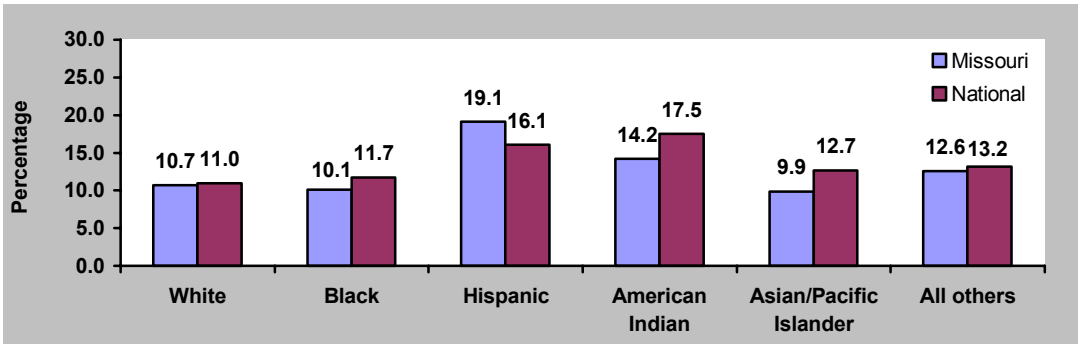
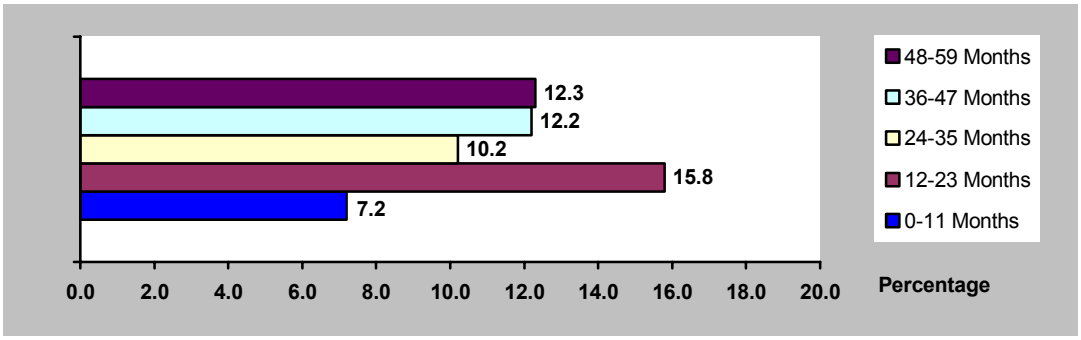
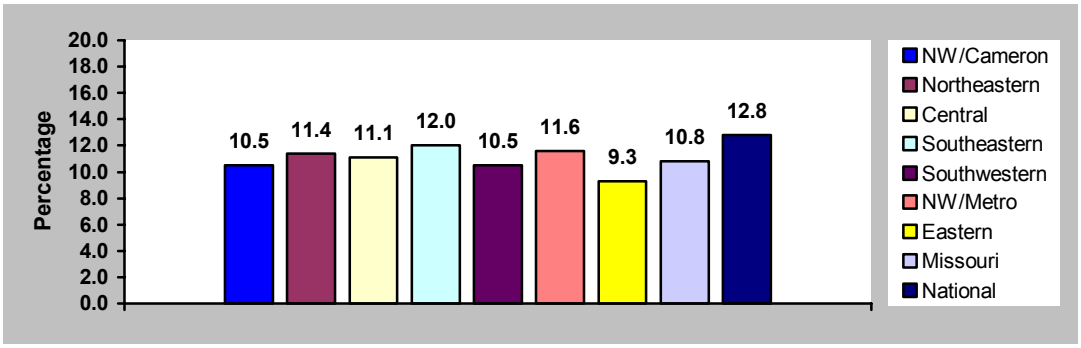


Figure 13. Prevalence of Overweight by Age, 2000 Missouri PedNSS



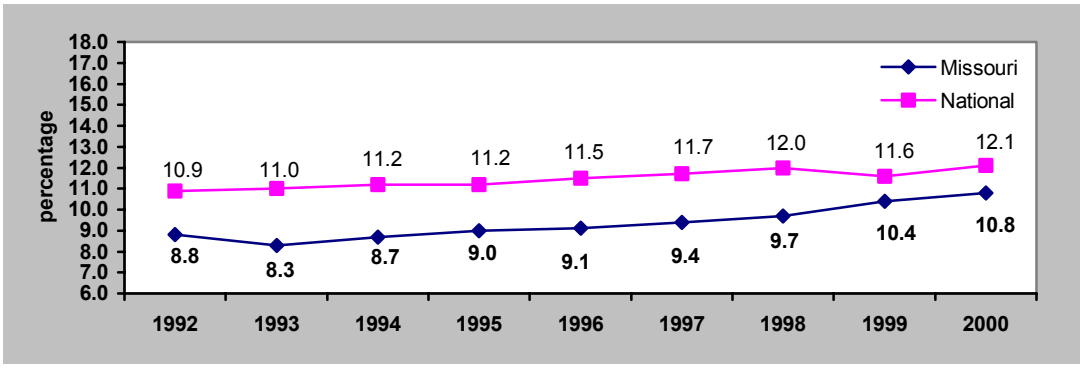
Among the five age groups, the children aged 12-23 months had the highest rate (15.8 percent) of overweight in 2000, and the children aged 0-11 months had the lowest rate (7.2 percent).

Figure 14. Prevalence of Overweight by Regions, State, and Nation, Missouri and National PedNSS 2000



The prevalence of overweight in the 2000 Missouri PedNSS was 10.8 percent, which was lower than the national rate (12.8 percent). Regionally, the Southeastern District had the highest percentage (12.0 percent) of overweight in 2000. The Eastern District had the lowest rate of overweight (9.3 percent) in the year.

Figure 15. Nine-Year Trends in Prevalence of Overweight, Missouri and National PedNSS 2000



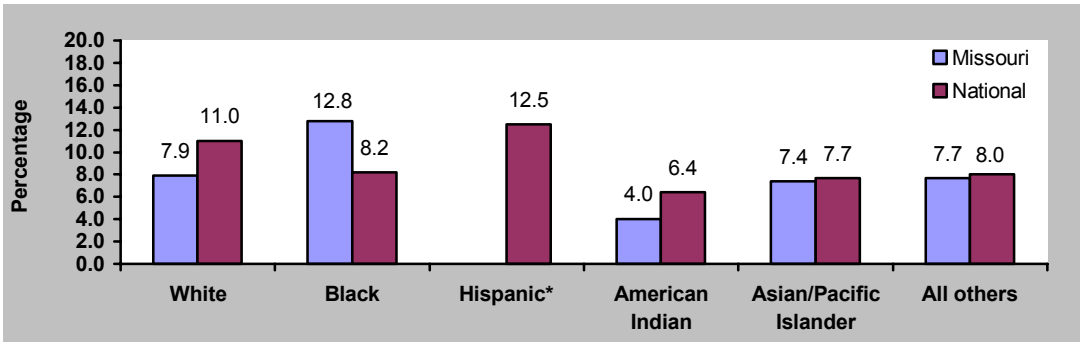
There had been a general upward trend in the percentages of overweight in the Missouri and national PedNSS among children under five years of age. There was only a slight decline from 8.8 percent in 1991 to 8.3 percent in 1993 in the trend for children in Missouri PedNSS, and a slight decline from 12.0 percent in 1998 to 11.6 percent in 1999 for children in the national PedNSS.

Low Birth Weight (≤ 2,500 grams)

Low birth weight in children is defined by CDC as a birth weight less than or equal to 2,500 grams or 5.5 pounds (redefined as < 2,500 grams in 2001). Low birth weight may occur when an infant is born at less than 37 weeks of gestation, or when intrauterine growth is compromised, or as a result of both conditions. In 2000, the prevalence of low birth weight in Missouri PedNSS was 9.1 percent, and that for the national PedNSS was 9.2 percent.

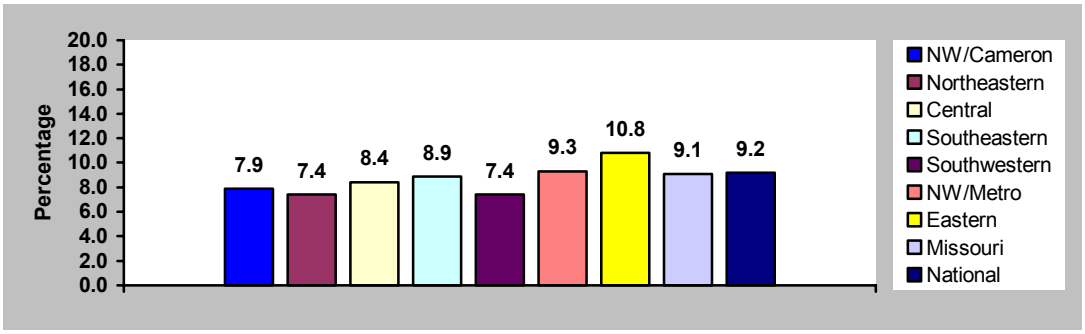
In the 2000 Missouri PedNSS, black children had the highest percentages of low birth weight (12.8 percent), and American Indian/Alaskan children had the lowest percentage (4.0 percent). Black children were the only race/ethnic group that had a higher rate of low birth weight than the national average in the year.

Figure 16. Prevalence of Low Birth Weight by Race/Ethnicity, 2000 Missouri and National PedNSS



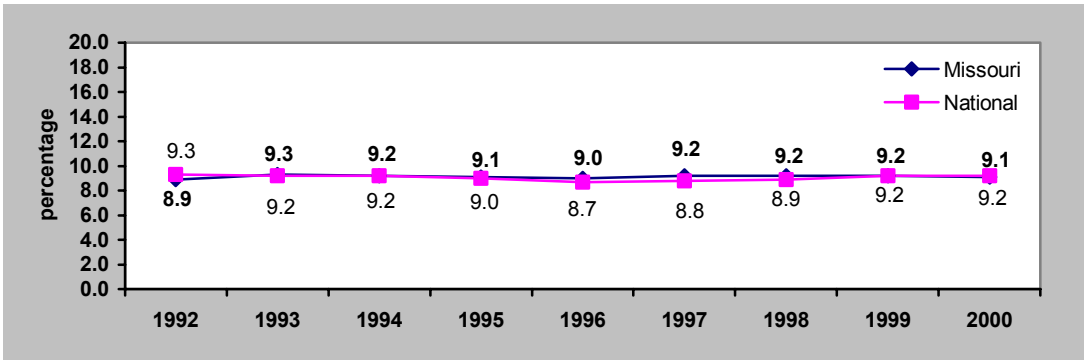
* Percentages are not calculated if < 100 records are available for analysis after exclusions.

Figure 17. Prevalence of Low Birth Weight by Regions, State, and Nation, Missouri and National PedNSS 2000



The prevalence of low birth weight in the 2000 Missouri PedNSS was 9.1 percent, which was nearly the same as that of the whole nation (9.2 percent). Compared with the national level of low birth weight, Missouri's Eastern District had a relatively higher rate of low birth weight in 2000. The Northeastern District and the Southeastern District had the lowest rate (7.4 percent) of low birth weight in 2000.

Figure 18. Nine-Year Trends in Prevalence of Low Birth Weight, Missouri and National PedNSS

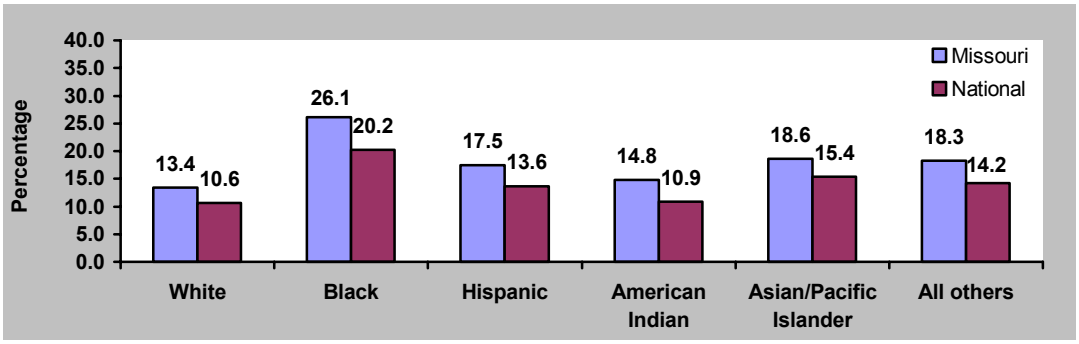


Both the trend of the low birth weight rate of Missouri PedNSS and that of the nation showed only slight fluctuations from 1992 to 2000. In addition, the two trends corresponded closely. The largest discrepancies between the two trends were the percentage difference (0.4 percent) in the year 1992 and the percentage difference (0.4) in the year 1997.

Anemia

Anemia is characterized by low levels of hemoglobin and/or hematocrit that result in a reduction in the oxygen carrying capacity of the blood. Although there are several causes of anemia, iron deficiency is the most common cause in the United States. In the Missouri PedNSS, low hemoglobin is used as an indicator for anemia. The case definition of anemia recommended by CDC is <5th percentile of the distribution of Hb concentration in a healthy reference population and is based on age, sex and (among pregnant women) stage of pregnancy.

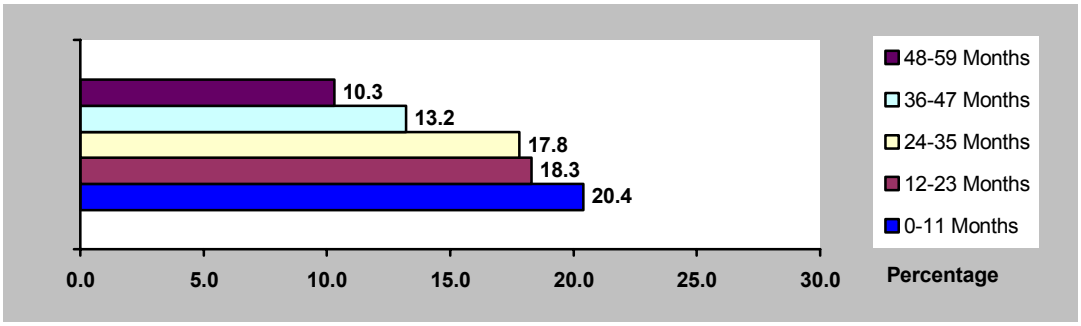
Figure 19. Prevalence of Anemia by Race/Ethnicity, 2000 Missouri and National PedNSS



The prevalence of anemia in the 2000 Missouri PedNSS was 16.6 percent, which was higher than that of the whole nation (13.8 percent). Compared with the national level of anemia,

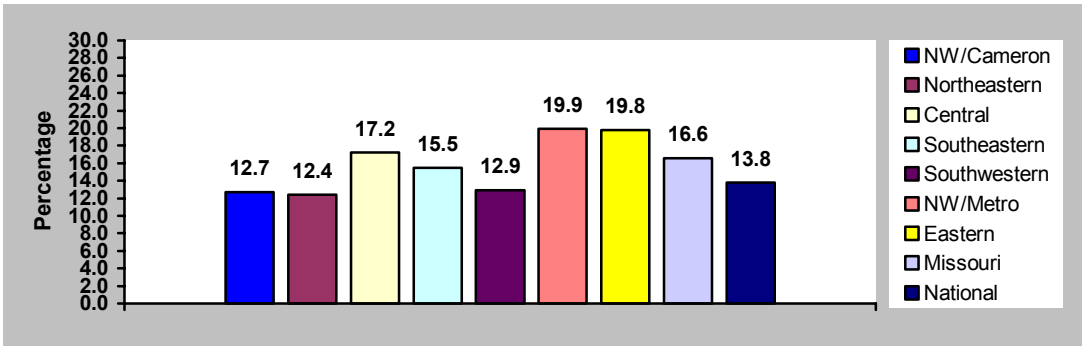
Missouri's black children had a much higher rate (26.1 percent) in 2000. The white children had the lowest rate (13.4 percent) of anemia in 2000.

Figure 20. Prevalence of Anemia by Age, 2000 Missouri PedNSS



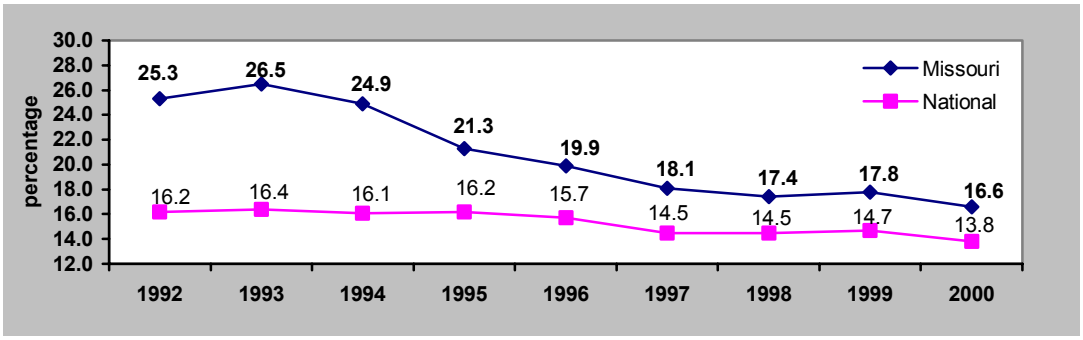
Among the five age groups, the children aged 0-11 months had the highest rate (20.4 percent) of anemia in 2000, and the children aged 48-59 months had the lowest rate (10.3 percent).

Figure 21. Prevalence of Anemia by Regions, State, and Nation, Missouri and National PedNSS 2000



Regionally, four of the seven regions of Missouri PedNSS (Northwestern/Metro, Eastern, Central, and Southeastern) had higher rates of anemia than the national average level. Especially, the Northwestern/Metro and the Eastern District had obviously higher percentages of anemia among children compared with other regions of Missouri and the nation.

Figure 22. Trends in Prevalence of Anemia, Missouri and National PedNSS



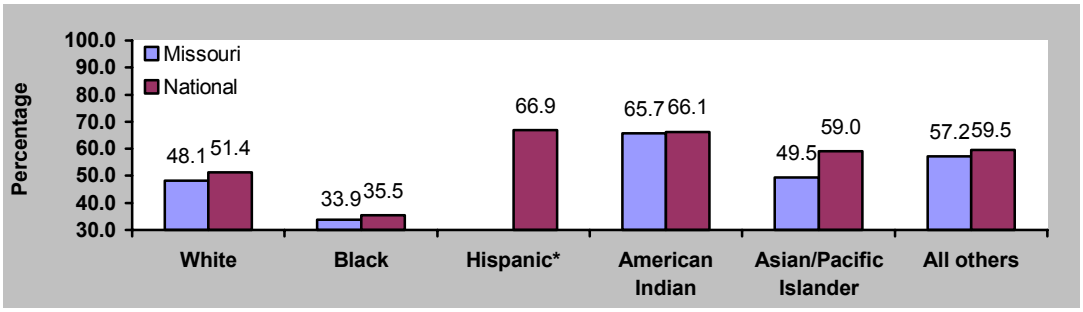
There had been a general declining trend in the rate of anemia among children in PedNSS in both Missouri and the nation. However, the rate of anemia of Missouri's PedNSS had always been higher than the average level of the nation, although the difference between the rate of Missouri and that of the nation is becoming smaller (the largest was 10.1 percent in 1993, and the smallest was 2.8 percent in 2000).

Ever Breastfed

The Year 2000 objective was to increase to at least 75 percent of mothers who breastfeed their babies in the early postpartum period. However, this objective was not achieved in the Missouri PedNSS population.

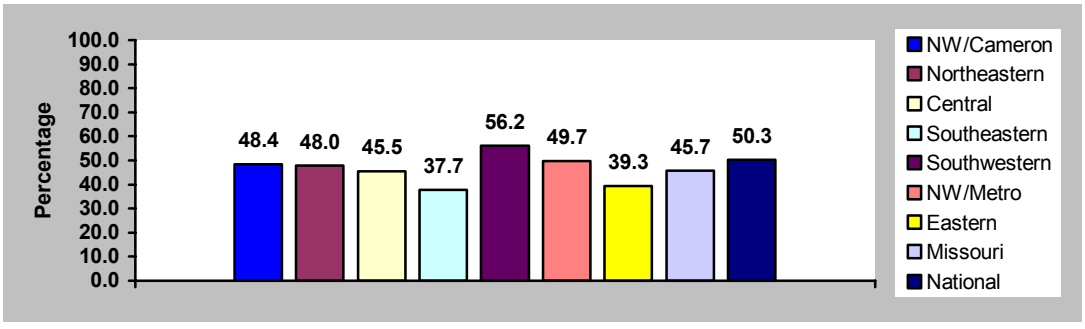
In 2000, the percentage of infants who were ever breastfed in the Missouri PedNSS was 45.7 percent, and that in the national PedNSS was 50.7 percent. Black children had the lowest percentage (33.9 percent) of ever being breastfed, while American Indian/Alaskan Native children had the highest rate (65.7 percent) on this indicator. American Indian/Alaskan Native was the only race/ethnic group that had a higher percentage of ever being breastfed than the national average level in that year.

Figure 23. Prevalence of Ever Being Breastfed by Race/Ethnicity, 2000 Missouri and National PedNSS



*Percentages are not calculated if < 100 records are available for analysis after exclusions.

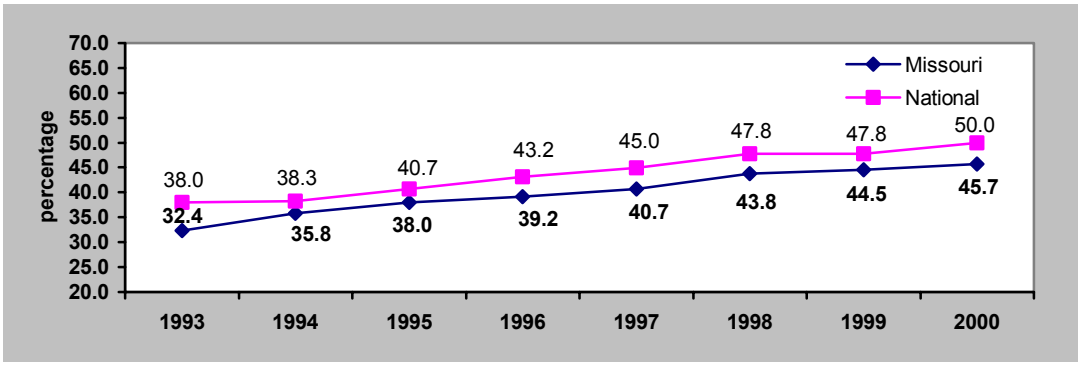
Figure 24. Prevalence of Ever Being Breastfed by Regions, State, and Nation, Missouri and National PedNSS 2000



Regionally, Missouri's Southwestern District had the highest rate of ever being breastfed (56.2 percent), and this rate was the only one that was higher than the national average level (50.3 percent) in 2000.

The rate of ever being breastfed for Missouri PedNSS increased from 32.4 percent in 1993 to 45.7 percent in 2000. The national rate of ever breastfeeding was 41.9 percent in 1993, and 50.0 percent in 2000. Comparatively, the rate in Missouri has been consistently lower that the national average.

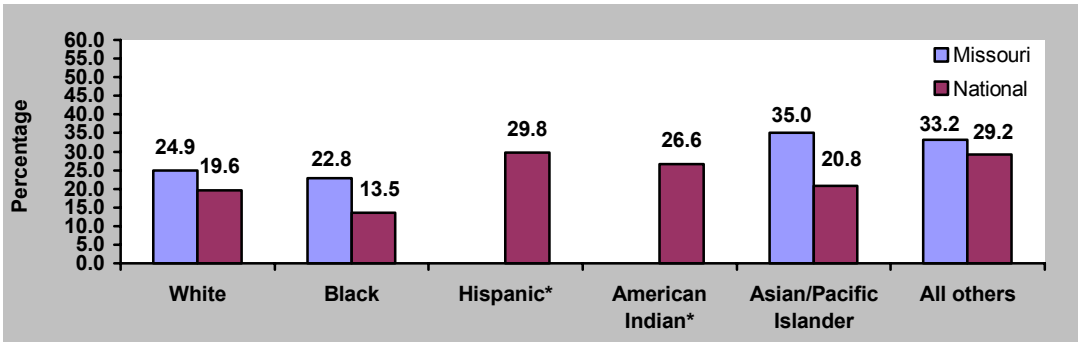
Figure 25. Trends in Rates of Ever Being Breastfed, Missouri and National PedNSS



Breastfeeding Duration for at Least 6 Months

In 2000, the percentage of infants who were breastfed for at least 6 months in Missouri PedNSS was 25.4 percent, and that in the national PedNSS was 20.3 percent.

Figure 26. Prevalence of Breastfeeding Duration for at Least 6 Months by Race/Ethnicity, 2000 Missouri and National PedNSS



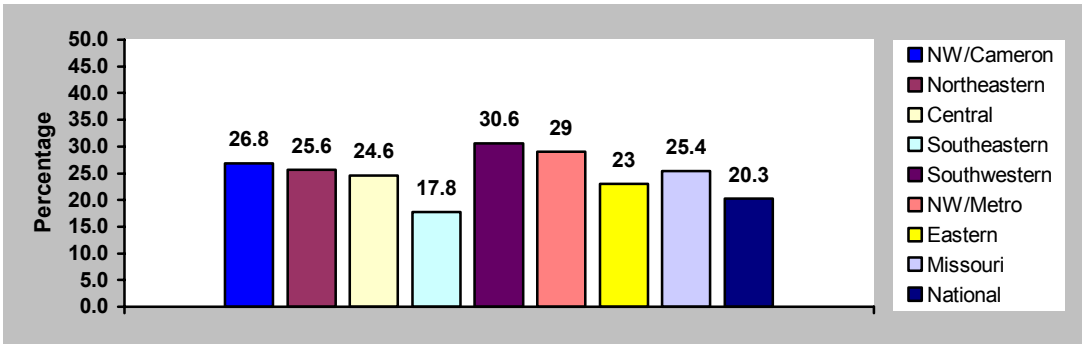
*Percentages are not calculated if < 100 records are available for analysis after exclusions.

The lowest rate of breastfeeding duration for at least 6 months in Missouri was found among black children, which was 22.8 percent, and the highest rate was found in the Asian/Pacific Islander group, which was 35.0 percent. Although Missouri's average percentage of the year was higher than the national average percentage, there was still a large gap between the status

quo and the national year 2000 objective (increase the proportion of breastfeeding at least 6 months to at least 50 percent).

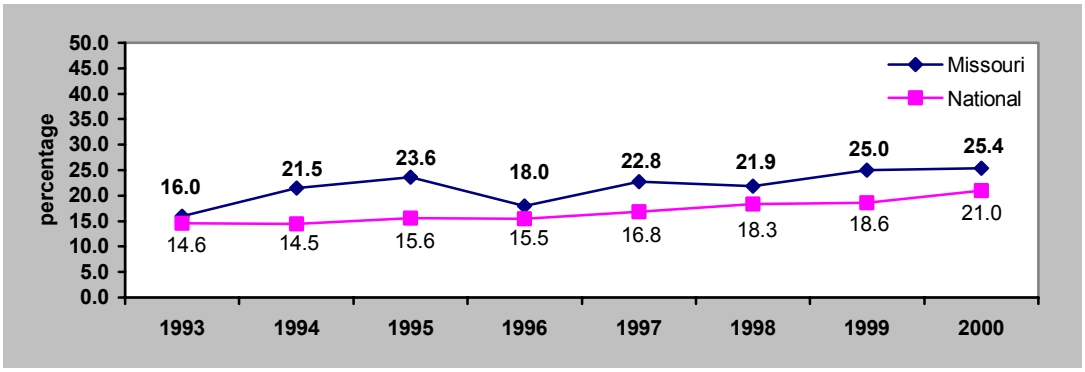
As for the regions, the Southwestern District of Missouri had the highest rate of breastfeeding duration for at least 6 months (30.6 percent) in 2000. The Southeastern District had the lowest percentage (17.8 percent) in this year. It was the only region that had a lower rate than the national average level in 2000.

Figure 27. Prevalence of Breastfeeding Duration For At Least 6 Months by Regions, State, and Nation, PedNSS 2000



There had been a steady increase in the duration of breastfeeding for at least 6 months for the national PedNSS population. Comparatively, the increasing trend of breastfeeding duration in Missouri's PedNSS population was not as stable as that of the nation. There was a sharp decline from 23.6 percent in 1995 to 18.0 percent in 1996, and then the rate went up each year to 25.4 percent in 2000.

Figure 28. Trends in Rates of Breastfeeding Duration for at Least 6 Months, Missouri and National PedNSS 2000

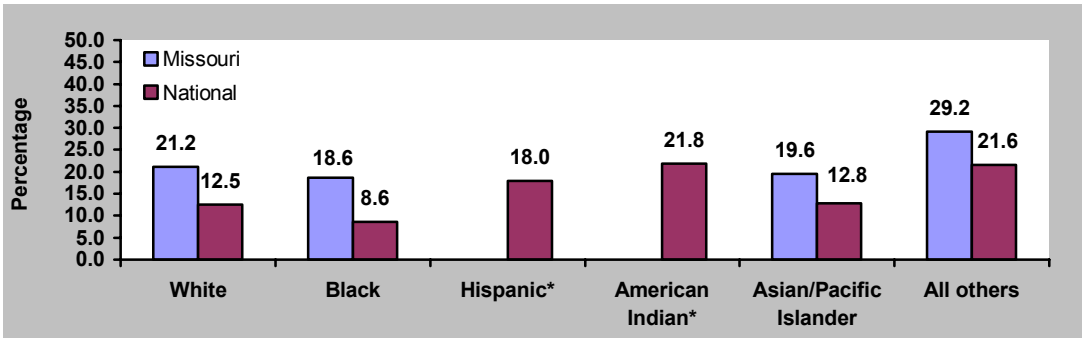


Breastfeeding Duration for at Least 12 Months

In 2000, the average rate of breastfeeding duration for at least 12 months was 21.3 percent in the Missouri PedNSS, and that in the national PedNSS was 12.8 percent. Missouri had a much higher average rate than the national one on this indicator.

Among the five race/ethnic groups, the highest rate (21.2 percent) was found among white children, and the lowest rate (18.6 percent) was among black children. However, there was not a large difference between the two rates.

Figure 29. Prevalence of Breastfeeding for at Least 12 Months by Race/Ethnicity, 2000 Missouri and National PedNSS



*Percentages are not calculated if < 100 records are available for analysis after exclusions.

All the seven regions in Missouri had higher percentages of breastfeeding duration for at least 12 months than the national average level (12.8 percent) in 2000. The highest rate (25.4 percent) was found in Southwestern District, and the lowest (14.1 percent) was found in Southeastern District.

Figure 30. Prevalence of Breastfeeding Duration For At Least 12 Months by Regions, State, and Nation, Missouri and National PedNSS 2000

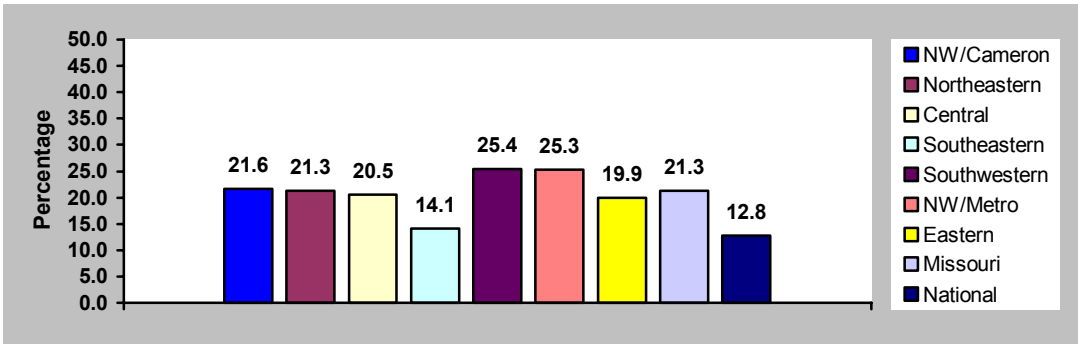
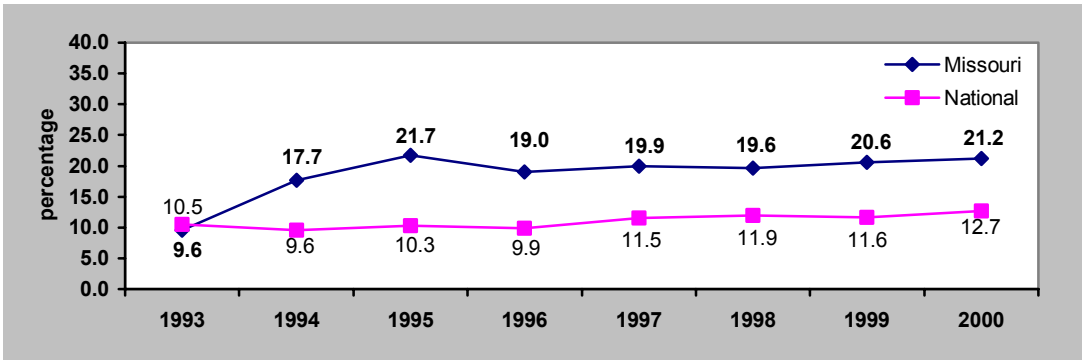


Figure 31. Trends in the Rates of Breastfeeding Duration for at Least 12 Months, Missouri and National PedNSS



The increase in the percentage of breastfeeding duration for at least 12 months in the nation had been stable during the years from 1993 to 2000. The trend of Missouri's PedNSS was not as stable as that of the nation. However, it is worth noting that since 1994, the difference between the percentage of breastfeeding for at least 12 months for the nation and that for Missouri reached to approximately 10 percent, and this difference had been maintained to the year 2000.

CONCLUSIONS AND RECOMMENDATIONS

In this report, eight health and nutritional status indicators (short stature, underweight, overweight, low birth weight, anemia, ever breastfed, breastfeeding duration for at least 6 months, and breastfeeding duration for at least 12 months) have been used to examine the health situation of Missouri PedNSS children. The high risk groups have been identified by demographic variables such as race/ethnic groups and geographic regions.

Looking from the perspective of race/ethnic groups, Black children in Missouri PedNSS was the group at highest risk with regard to the selected indicators. The black children in Missouri PedNSS had the highest rates of short stature, the highest rates of underweight, the highest rates of low birth weights, the highest rates of anemia, the lowest rate of ever being breastfed, the lowest rate of breastfeeding duration for at least 6 months, and the lowest rate of breastfeeding duration for at least 12 months in 2000. It is highly recommended that future intervention programs should focus more attention on black children and black pregnant women, and more efforts should be given to the clarification of the underlying causes for this phenomenon.

The second highest at risk race/ethnic group in Missouri PedNSS was the Asian/Pacific Islander children. They had high rates of underweight, high rates of anemia, and low rates of breastfeeding duration for at least 6 months and breastfeeding duration for at least 12 months.

The Hispanic children were another group at risk with the highest rate of overweight in this year.

White children group had a relatively high rate of short stature and low rates of breastfeeding duration for at least 6 months and breastfeeding duration for at least 12 months in this year.

Looking from the perspective of the seven regions of Missouri, a ranking method was adopted for evaluating the degree of risk of health problems regarding the eight health and nutritional risk indicators for the seven PedNSS regions. (Refer to Appendix, Table 1)

With this method, it was concluded that in 2000 the Eastern District of Missouri PedNSS had the highest risk of health problems in regard to the eight health situation indicators, and the Southwestern District had the lowest risk. The Central District and the Southeastern District also had relatively higher risk situations, especially to breastfeeding problems. It is recommended that the programs that focus attention and resource on black children should also focus on Eastern District of Missouri PedNSS. From the above analysis, it is highly probable that the black children in the Eastern District are the at risk children with regard to the eight indicators, and therefore it is necessary for the state and local government agencies to pay more attention to this ethnic group in this region.

Looking from the perspective of trend, Missouri PedNSS's short stature trend, underweight trend, and anemia trend had been going down generally from 1992 to 2000. There had been obvious improvements for breastfeeding in these years. Rates in breastfeeding (ever being breastfed, breastfeeding duration for at least 6 months, breastfeeding duration for at least 12 months) had been all going up generally from 1993 to 2000. However, there were still large discrepancies from the status quo to the year 2000 objectives on these indicators, which indicate more efforts are needed to achieve the goals. Also, quite contrary to the efforts made in these years, the trend of overweight in Missouri PedNSS had been going up, which had become a major challenge to both local and state government agencies.

Appendix

Ranking Method for Evaluating Risk in Regard to the Eight Nutrition and Health Indicators in the Seven Regions of Missouri

The method has three steps:

(1) By comparing the rate of each region to the mean value of the state of a perspective year, an asterisk was assigned to a region if this region's value was higher (or lower) than the mean value of the state for a certain indicator.
(2) Total number of asterisks were counted for each region on all the eight health risk indicators for the two years.
(3) The seven regions were ranked in regard to the risk by putting the region that had more asterisks on the higher order and that had the fewer number of asterisks on the lower order.

Table 1. Missouri PedNSS Regions Ranking for Having Risk in Regard to the Eight Nutrition and Health Indicators in 2000

Health and Nutrition Risk Indicators	State Preva-lence	NW/ Cameron	North-eastern	Central	South-eastern	South-western	NW/ Metro	Eastern
Short Stature >	9.1%	*	*	*				*
Underweight >	16.6%							*
Overweight >	10.8%		*	*	*		*	
Low Birth Weight >	9.1%						*	*
Anemia >	16.6%			*			*	*
Ever Breastfed <	45.7%			*	*			*
Breastfeeding for at Least 6 Months <	25.4%			*	*			*
Breastfeeding for at Least 12 Months <	21.3%			*	*			*
Total Number of Asterisks for Each Region		**1**	**2**	**6**	**4**	**0**	**3**	**7**
Ranking of Risk for Each Region		**6**	**5**	**2**	**3**	**7**	**4**	**1**

> An asterisk was assigned to a region if its rate was higher than the state prevalence.
< An asterisk was assigned to a region if its rate was lower than the state prevalence.